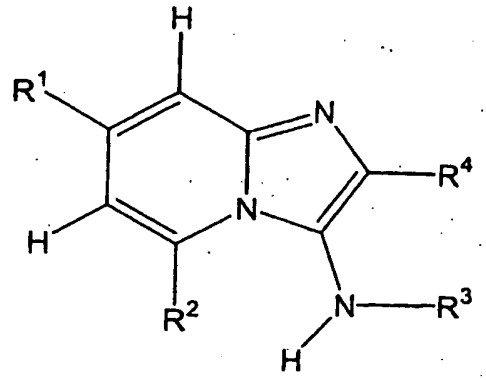
WHAT IS CLAIMED IS:

1. A method of inhibiting nitric oxide synthase in a mammal, said method comprising administering to said mammal an effective nitric oxide synthase inhibiting amount of at least one substituted imidazo[1,2-a]-pyridin-3-yl-amide or -amine compound corresponding to formula I



I

wherein,

R^1 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkenyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkinyl radical, a C_{3-8}-cycloalkyl radical, a C_{3-8}-cycloalkyl radical which is bonded via a C_{1-8}-alkylene group, an unsubstituted or at least monosubstituted aryl or heteroaryl radical, F, Cl, Br, I, CN, NO_2, NH_2, $C(=O)R^5$, CO_2H, CO_2R^6, OH or OR^7;

R^2 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkenyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkinyl radical, a C_{3-8}-cycloalkyl radical, a C_{3-8}-cycloalkyl radical which is bonded via a C_{1-8}-alkylene group, an unsubstituted or at least

monosubstituted aryl or heteroaryl radical, H, F, Cl, Br, I, CN, NO_2, NH_2, $C(=O)R^5$, CO_2H, CO_2R^6, OH or OR^7;

R^3 represents H, $C(=O)R^8$ or SO_2R^8;

R^4 represents H, an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkenyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkinyl radical, a C_{3-8}-cycloalkyl radical, a C_{3-7}-heterocyclyl radical, an unsubstituted or at least monosubstituted aryl or heteroaryl radical, a C_{3-8}-cycloalkyl radical which is bonded via a C_{1-8}-alkylene group, a C_{3-7}-heterocyclyl radical which is bonded via a C_{1-8}-alkylene group, or an unsubstituted or at least monosubstituted aryl or heteroaryl radical which is bonded via a C_{1-8}-alkylene group;

R^5 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkenyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkinyl radical, a C_{3-8}-cycloalkyl radical, a C_{3-8}-cycloalkyl radical which is bonded via a C_{1-8}-alkylene group, a C_{3-7}-heterocyclyl radical, an unsubstituted or at least monosubstituted aryl or heteroaryl radical or an unsubstituted or at least monosubstituted aryl or heteroaryl radical which is bonded via a C_{1-8}-alkylene group;

R^6 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkenyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkinyl radical, a C_{3-8}-cycloalkyl radical, a C_{3-8}-cycloalkyl radical which is bonded via a C_{1-8}-alkylene group, an unsubstituted or at least monosubstituted aryl or heteroaryl radical, or an unsubstituted or at least monosubstituted aryl or heteroaryl radical which is bonded via a C_{1-8}-alkylene group;

R^7 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkenyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkinyl radical, a C_{3-8}-cycloalkyl radical, a C_{3-8}-cycloalkyl radical which is bonded via a C_{1-8}-alkylene group, an unsubstituted or at least monosubstituted aryl or heteroaryl radical, or an unsubstituted or at least monosubstituted aryl or heteroaryl radical which is bonded via a C_{1-8}-alkylene group; and

R^8 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkenyl radical, an unsubstituted or at least monosubstituted C_{2-8}-alkinyl radical, a C_{3-8}-cycloalkyl radical, a C_{3-8}-cycloalkyl radical which is bonded via a C_{1-8}-alkylene group, an unsubstituted or at least monosubstituted aryl or heteroaryl radical, or an unsubstituted or at least monosubstituted aryl or heteroaryl radical which is bonded via a C_{1-8}-alkylene group;

or a salt thereof with a physiologically acceptable acid.

2. A method according to claim 1, wherein said compound is present in the form of a free base.

3. A method according to claim 1, wherein R^1 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical, F, Cl, Br, CN, NO_2, NH_2, $C(=O)R^5$, CO_2H, CO_2R^6, OH or OR^7.

4. A method according to claim 1, wherein R^1 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical.

5. A method according to claim 1, wherein R^2 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical.

6. A method according to claim 1, wherein R^2 represents H.

7. A method according to claim 1, wherein R^3 represents $C(=O)R^8$.

8. A method according to claim 1, wherein R^3 represents H.

9. A method according to claim 1, wherein R^4 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical.

10. A method according to claim 1, wherein R^4 represents an unsubstituted or at least monosubstituted aryl or heteroaryl radical.

11. A method according to claim 1, wherein R^5 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical or an unsubstituted or at least monosubstituted aryl or heteroaryl radical.

12. A method according to claim 1, wherein R^6 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical or an unsubstituted or at least monosubstituted aryl or heteroaryl radical.

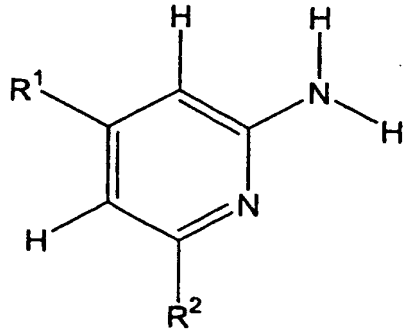
13. A method according to claim 1, wherein, R^7 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical or an unsubstituted or at least monosubstituted aryl or heteroaryl radical.

14. A method according to claim 1, wherein R^8 represents an unsubstituted or at least monosubstituted C_{1-8}-alkyl radical or an unsubstituted or at least monosubstituted aryl or heteroaryl radical.

15. A method according to claim 1, wherein the compound of formula I is 7-methyl-2-thiophen-3-yl-imidazo[1,2-a]pyridin-3-yl-amine or a salt thereof with a physiologically acceptable acid.

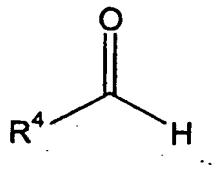
16. The method of claim 1, wherein said compound is present as a hydrochloride salt.

17. A process for preparing a substituted imidazo[1,2-a]-pyridin-3-yl-amine compound corresponding to formula I according to claim 1, wherein the radical R^3 represents H, comprising the step of reacting at least one substituted 2-aminopyridine corresponding to formula II



II

in a solvent or solvent mixture with at least one aldehyde corresponding to formula III



III

and at least one alkali metal cyanide under irradiation with microwaves, and isolating the compound of formula I wherein the radical R^3 represents H.

18. A process according to claim 17, further comprising the step of purifying the compound of formula I, wherein the radical R^3 represents H.

19. A process according to claim 17, wherein the irradiation with microwaves is carried out at a power of 100 to 1,200 watts.

20. A process according to claim 19, wherein the irradiation with microwaves is carried out at a power of 100 to 250 watts.

21. A process according to claim 17, wherein the irradiation is carried out with microwaves of a frequency in the range from 850 to 2,250 MHz.

22. A process according to claim 17, wherein the irradiation is carried out with microwaves of a frequency in a range selected from the group of ranges consisting of 890-940 MHz, 2,437-2463 MHz, 5,725-5875 MHz and 22,000-

22,250 MHz.

23. A process according to claim 17, wherein the step of reacting is carried out at a maximumtemperature of up to the boiling point of the solvent or solvent mixture.

24. A process according to claim 23, wherein the step of reacting is carried out under reflux of the solvent or solvent mixture.

25. A process according to claim 17, wherein the step of reacting comprises reacting equimolar amounts of a substituted 2-aminopyridine of formula II, an aldehyde of formula III, and an alkali metal cyanide.

26. A process according to claim 17, wherein the aldehyde of formula III is in the form of a bisulfite adduct.

27. A process according to claim 17, wherein the alkali metal cyanide is potassium cyanide, sodium cyanide or a mixture thereof.

28. A process according to claim 27, wherein the alkali metal cyanide is potassium cyanide.

29. A process according to claim 17, wherein the solvent is water or a water-based solvent mixture.

30. A process according to claim 17, wherein the step of reacting is carried out under a pressure greater than ambient pressure.

31. A process according to claim 30, wherein the step of reacting is carried out under an elevated pressure of up to 3 bar.

32. A process for preparing a substituted imidazo[1,2-a]-pyridin-3-yl-amide compound corresponding to formula I according to claim 1, wherein the radical R^3 represents $(C=O)R^8$, said process comprising the steps of: reacting at least one compound of formula I wherein the radical R^3 represents H, with at least one compound corresponding to the formula R^8-(C=O)-OH, R^8-(C=O)-X or R^8-(C=O)-O-(C=O)-R^8 wherein X represents Cl, Br or I, to yield a compound of formula I, wherein the radical R^3 represents $(C=O)R^8$, and

isolating the compound of formula I wherein the radical R^3 represents $(C=O)R^8$.

33. The process of claim 32, further comprising the step of purifying the compound of formula I wherein the radical R^3 represents $(C=O)R^8$.

34. The process of claim 32, wherein the step of reacting is carried out in a nonpolar solvent or a polar, protic solvent, or a mixture thereof.

35. The process of claim 32, wherein the step of reacting is carried out in a polar, aprotic solvent or a mixture of at least two solvents selected from the group consisting of nonpolar solvents, polar, protic solvents, and polar, aprotic solvents.

36. The process of claim 32, wherein said step of reacting is carried out at a temperature of from 0 to 300 °C.

37. The process of claim 36, wherein said step of reacting is carried out at a temperature of from 10 to 250 °C.

38. The process of claim 32, wherein the step of reacting is carried out with an excess of the compound corresponding to the formula R^8-(C=O)-O-(C=O)-R^8 in an aprotic solvent at a temperature of from 25 to 250 °C.

39. The process of claim 32, wherein the step of reacting is carried out with an excess of the compound corresponding to the formula R^8-(C=O)-O-(C=O)-R^8, without a solvent, under irradiation with microwaves.

40. A process for preparing a substituted imidazo[1,2-a]-pyridin-3-yl-amide compound corresponding to formula I according to claim 1, wherein the radical R^3 represents SO_2R^8, said process comprising the steps of reacting at least one compound of formula I wherein the radical R^3 represents H with at least one compound corresponding to the formula R^8-SO_2-OH, R^8-SO_2-X or R^8-SO_2-O-SO_2-R^8 wherein X represents Cl, Br or I, to yield a compound of formula I wherein the radical R^3 represents SO_2R^8, and

isolating the compound of formula I wherein the radical R^3 represents SO_2R^8.

41. The process of claim 40, further comprising the step of purifying the

compound of formula I wherein the radical R^3 represents SO_2R^8.

42. The process of claim 40, wherein the step of reacting is carried out in a nonpolar solvent or a polar, protic solvent, or a mixture thereof.

43. The process of claim 40, wherein the step of reacting is carried out in a polar, aprotic solvent or a mixture of at least two solvents selected from the group consisting of nonpolar solvents, polar, protic solvents, and polar, aprotic solvents.

44. The process of claim 40, wherein said step of reacting is carried out at a temperature of from 0 to 300 °C.

45. The process of claim 44, wherein said step of reacting is carried out at a temperature of from 10 to 250 °C.

46. A method for treating a condition selected from the group consisting of migraine, septic shock, neurodegenerative disease, inflammation, inflammatory pain, cerebral ischaemia, diabetes, meningitis, arteriosclerosis, fungal disease, and a wound in a mammal, said method comprising administering a pharmaceutically effective amount of a compound according claim 1 to said mammal.

47. A method according to claim 46 wherein said condition is neurodegenerative disease selected from the group consisting of multiple sclerosis, Parkinson's disease, Alzheimer's disease, and Huntington's disease.